STATIC WEB HOSTING

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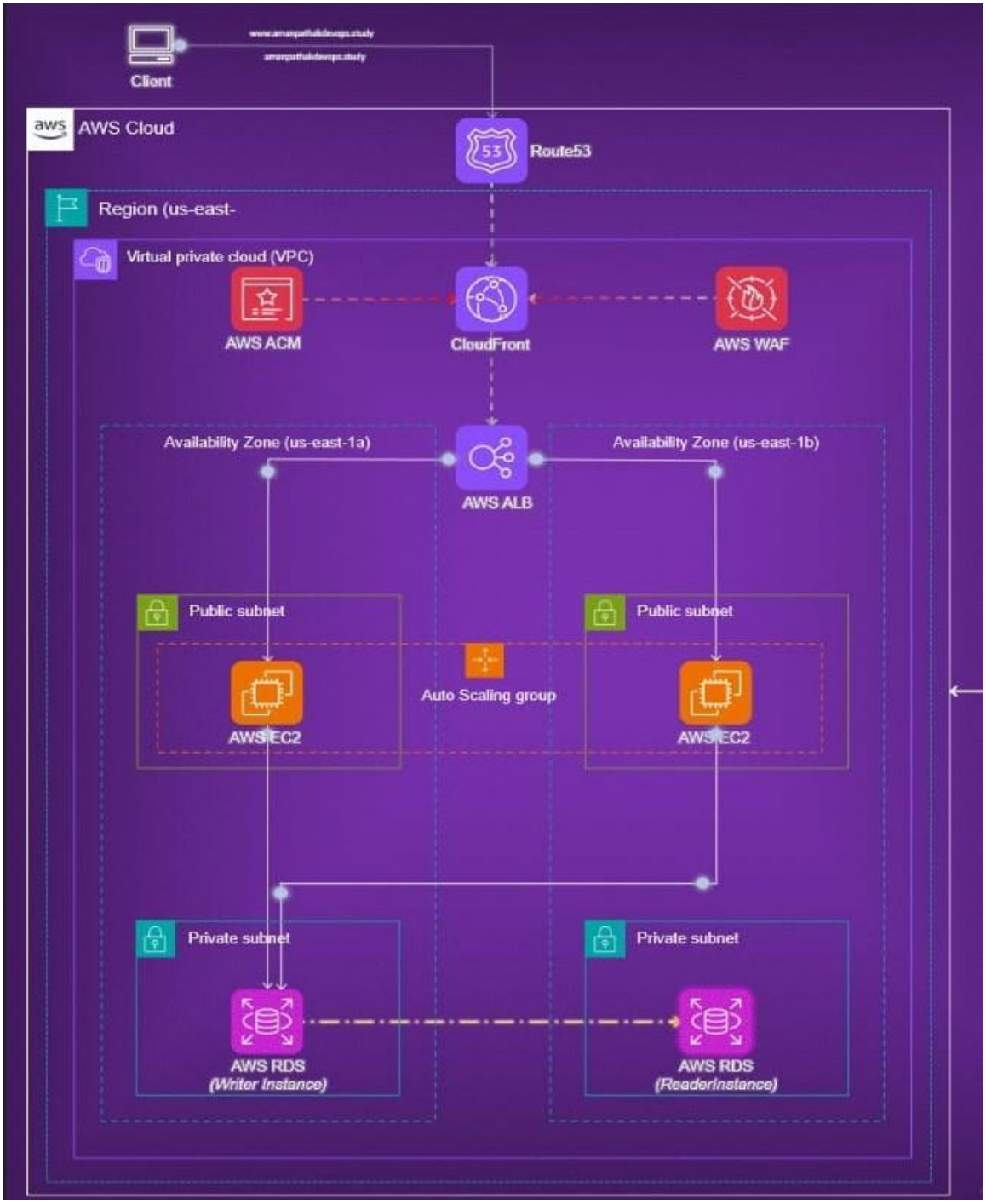
Batch: 138

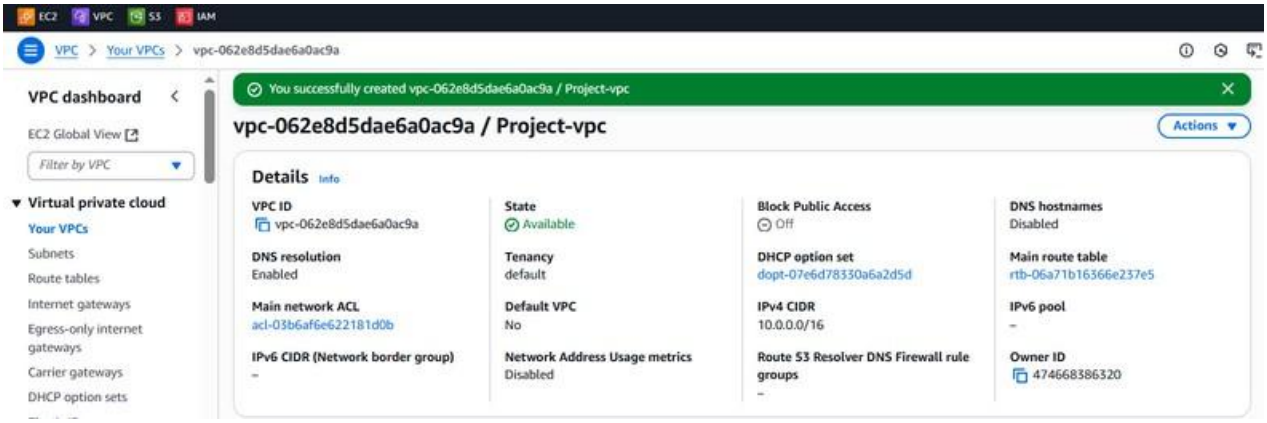


The above setup represents a Static Web Hosting architecture on AWS:

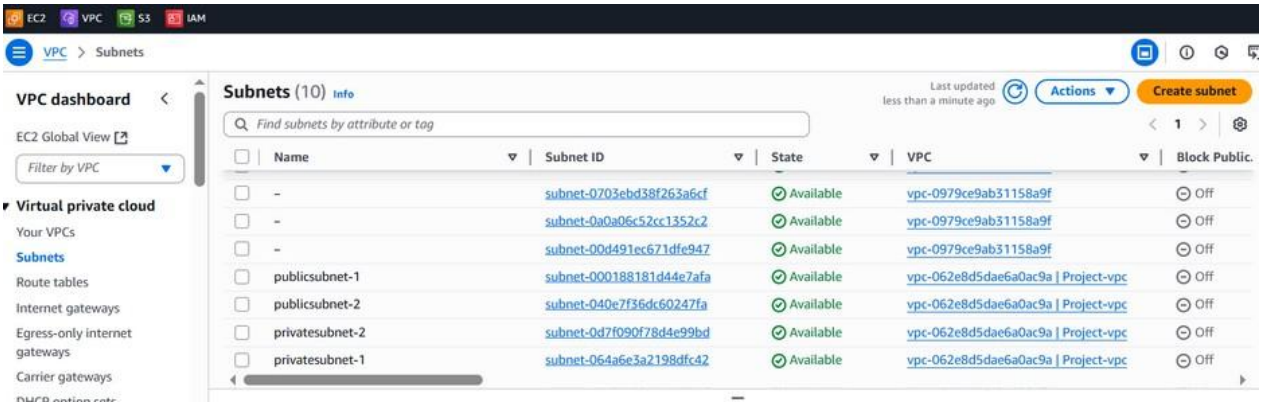
- It routes user requests via Amazon Route 53 to a scalable, secure web application that is housed on EC2 instances behind an Application Load Balancer (ALB).
- The application connects to an RDS database located in private subnets and is distributed across many Availability Zones with Auto Scaling for high availability.
- Performance, security, and HTTPS encryption are enhanced with the integration of services such as CloudFront, ACM, and WAF.

To achieve this project, the following steps were performed:

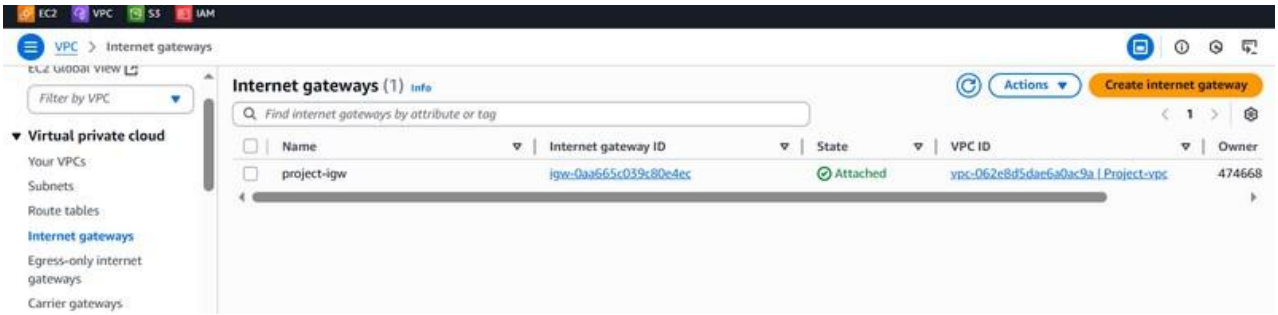
Step 1 : Creating a VPC and its components



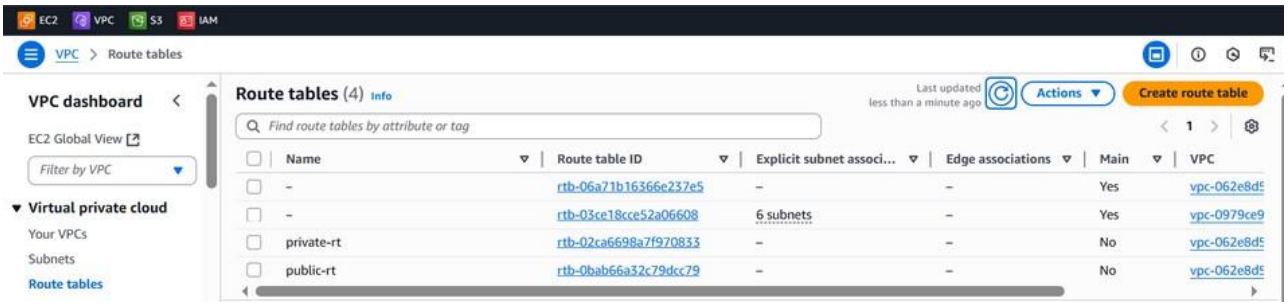
- Subnet Setup: 2 Public, 2 Private

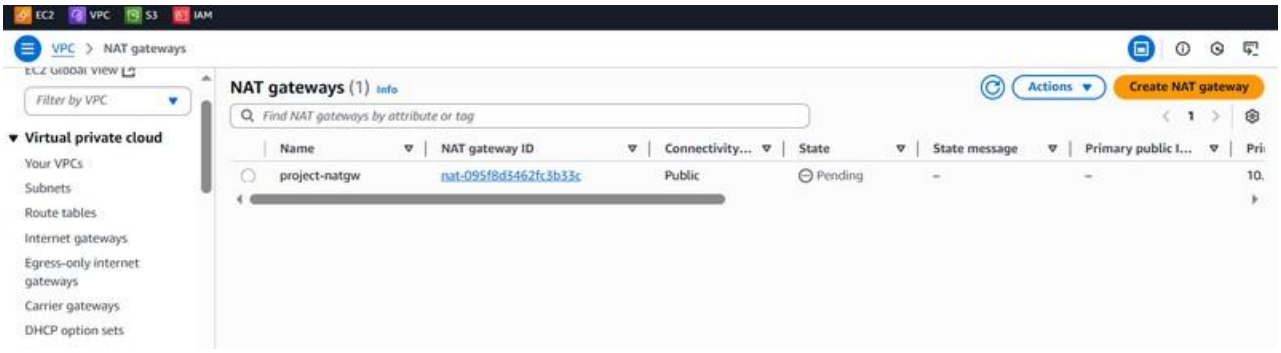


- Internet Gateway Setup and attach to VPC.



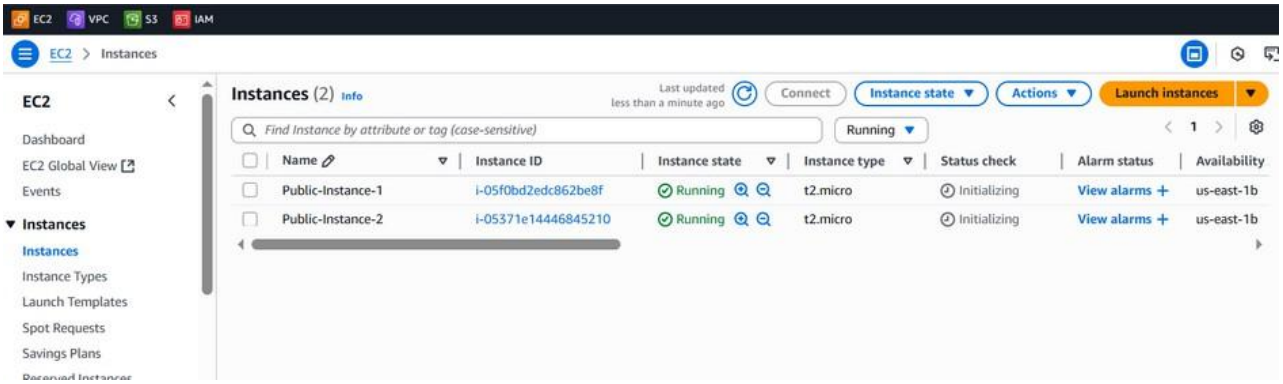
- Create Route tables and NAT Gateway





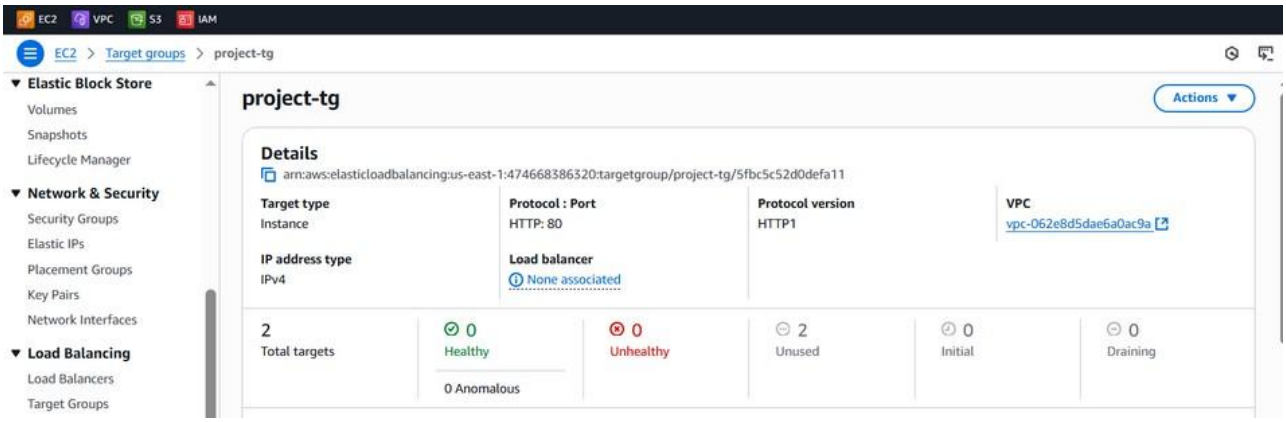
After creating the subnets, route tables are configured and associated with their respective subnets. An Internet Gateway (IGW) is attached to the public route table to enable internet access, while a NAT Gateway (NAT-GW) is connected to the private route table to allow outbound internet access for resources in private subnets.

Step 2: Launch EC2 Instances



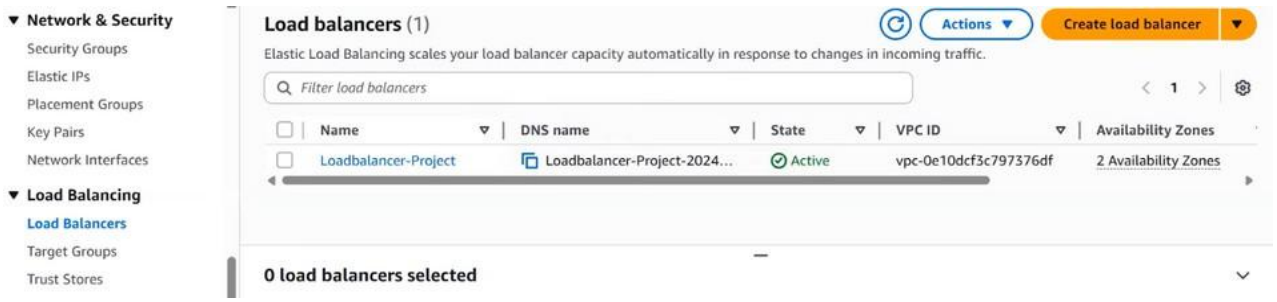
Step 3: Create Target Group

- Create a target group named project-tg and select the appropriate VPC.
- Choose the running public instances (Public-Instance-1 and Public-Instance-2), click "Include as pending", and then proceed to create the target group.



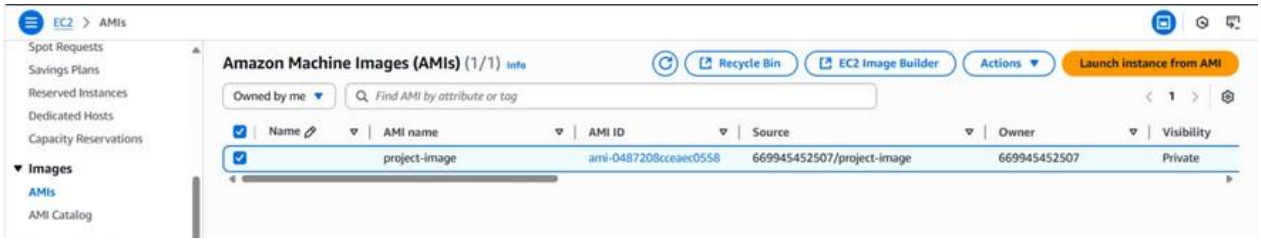
Step 4: Create a Load Balancer

- Create an Application Load Balancer.
- Attach the previously created target group to the load balancer during configuration.
- Once created, copy the Load Balancer DNS name and paste it into the browser to access the application.
- When a request is made, the Load Balancer distributes traffic evenly between the two servers.
- Each time the page is refreshed, the request is forwarded to either server-1 or server-2 in a round-robin manner.

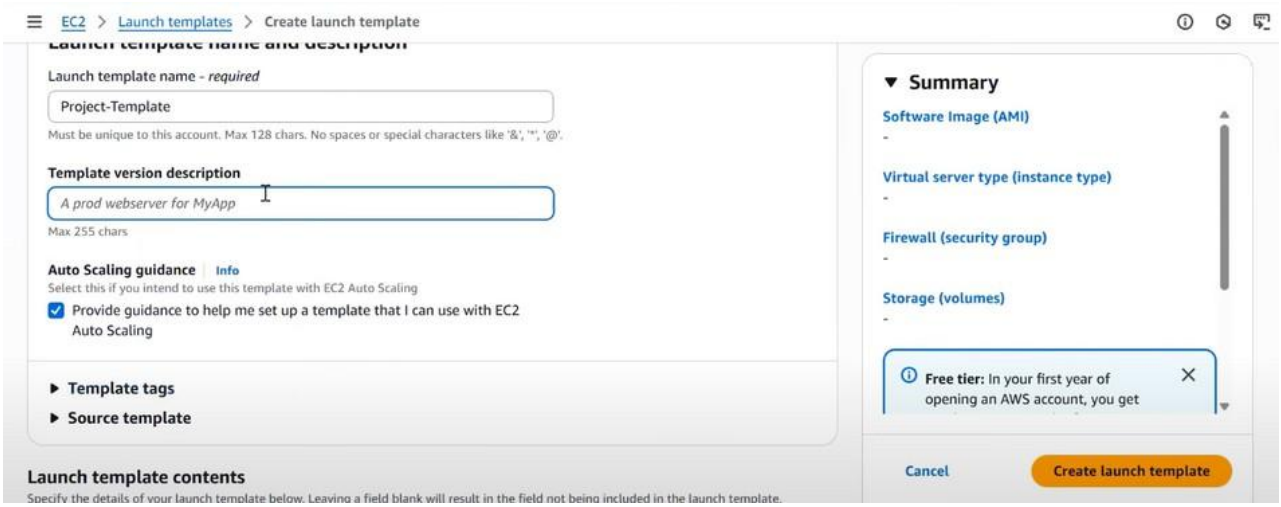


Step 5: Create an AMI (image)

- After running instances , click on actions.
- Click on image template and click on image.
- Name image as project-img.
- Click create image.

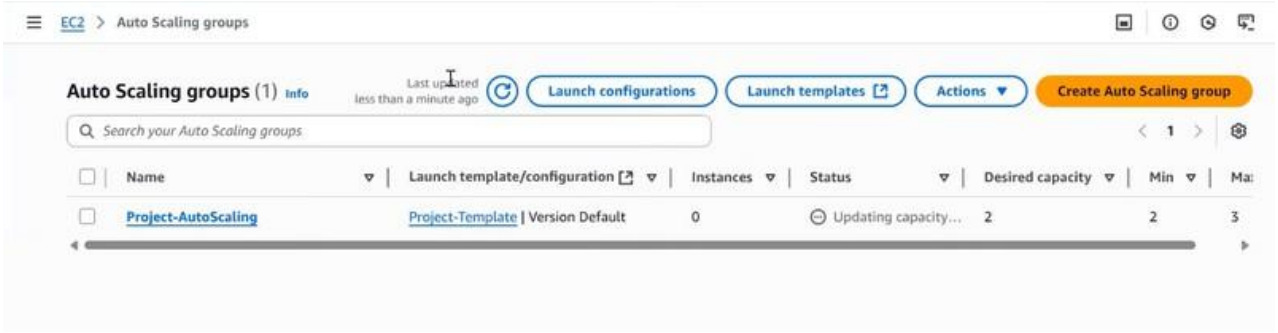


Step 6: Launch Template



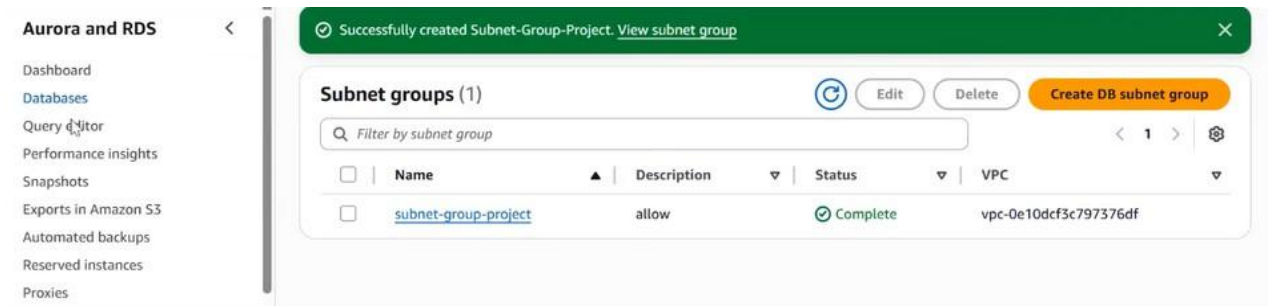
Step 7: Creating Autoscaling group

- Open the Auto Scaling Group section and click “Create Auto Scaling Group”.
- Enter the name as Project-AutoScaling, select the existing launch template (Project-Template), and proceed.
- Choose the VPC, attach the existing Load Balancer, set the desired capacity to 2 and maximum to 5, then click Next.
- Finally, review the configuration and click “Create Auto Scaling Group”.



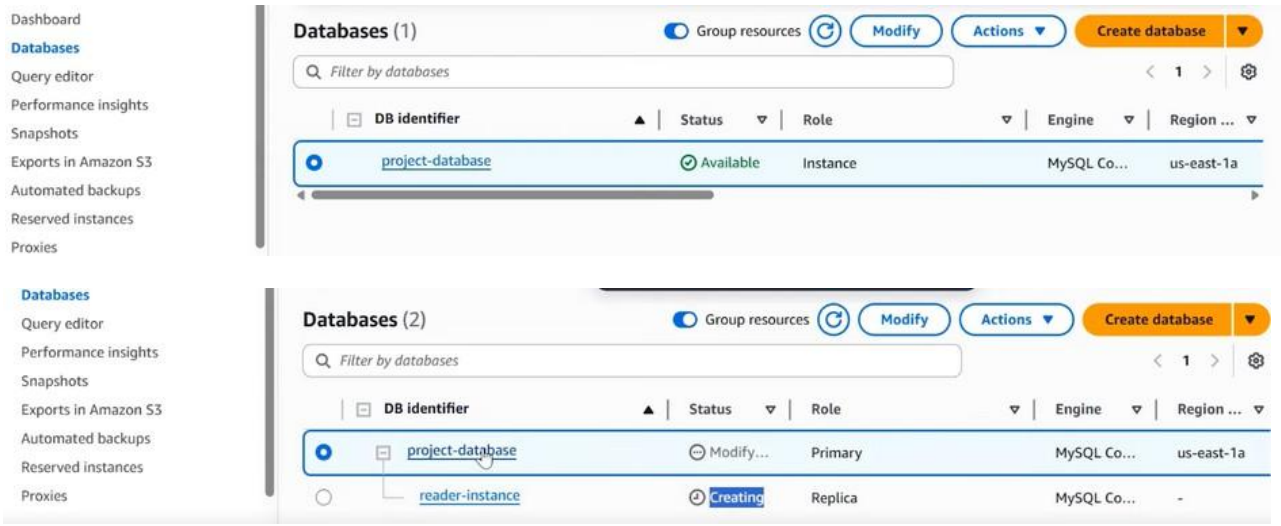
Step 8: Create Subnet group

- Give availability zones and select all private subnets from each zone.
- Create DB subnet group.



Step 9: Create Database (RDS)

- An RDS instance was launched as the primary database (Writer), and a Read Replica was created to handle read operations.
- This setup improves performance and ensures high availability for the database layer.



Step 10 : ACM - Request SSL Certificate

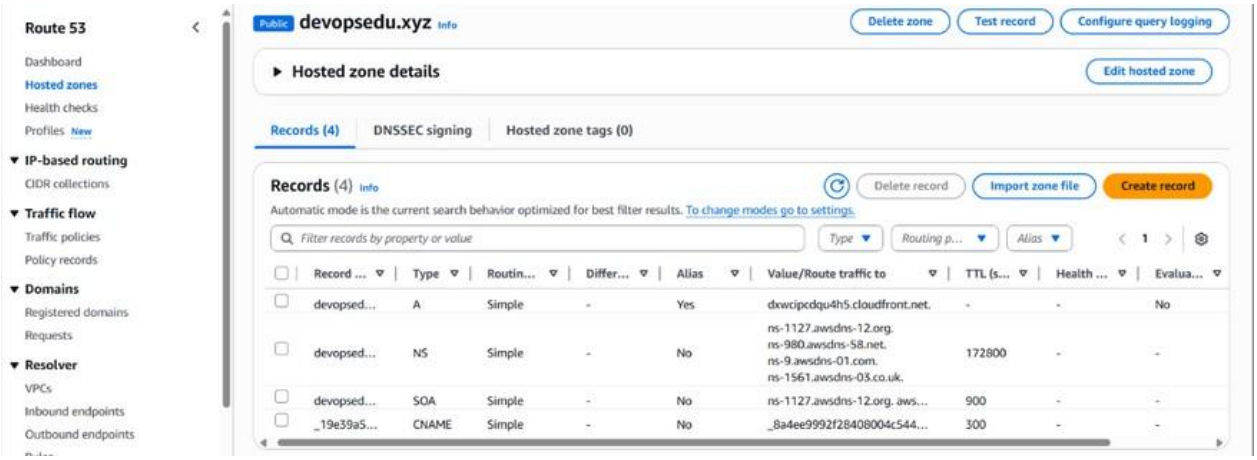
- Requested an SSL/TLS certificate in AWS Certificate Manager (ACM)

Step 11 : Route 53 Creating hosted zones, Records

- Go to Route 53 and click on “Create Hosted Zone”.
- Enter your domain name, select the type as Public, and click “Create Hosted Zone”.
- Next, create two records:

A Record:
Click “Create Record”, enter the subdomain as www, select the type as A, and enable Alias.
Choose the endpoint as Alias to Application Load Balancer, and select your Load Balancer.

CNAME Record:
Create another record, enable Alias, and choose the endpoint as Alias to another record in this hosted zone.
Select the previously created A record, and click “Create Record”.

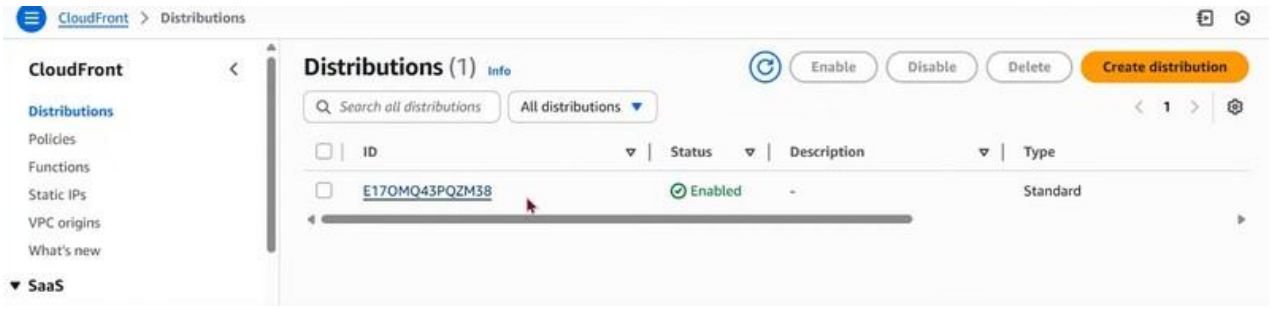


Step 12: Creating CloudFront

Set up aCloud Front Distribution using the certificate.

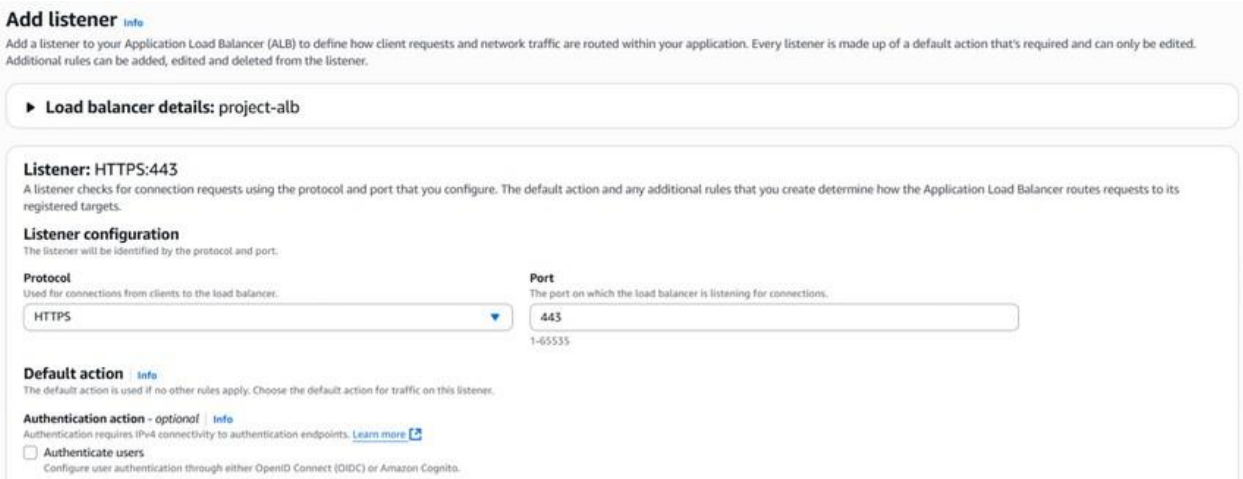
Next select load balancer

Enable WAF and select your SSL certificate, then click on create distributions.

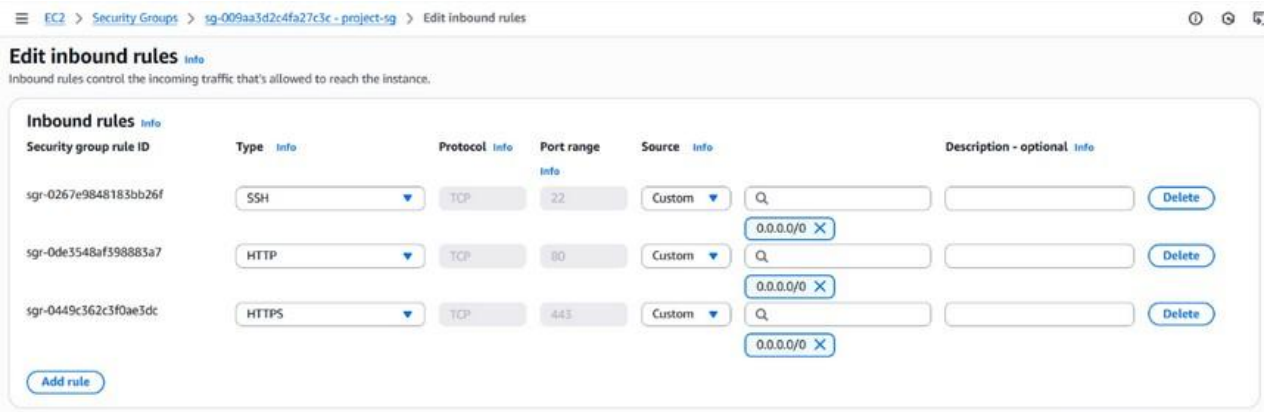


Next add this distribution in Route 53 records. secure communication.

Added an HTTPS listener to the Load Balancer.



We have to add HTTPS route to the Load Balancer Security Group.



Step 13: Testing and Verification

- Copy your domain and paste it in browser you will see lock symbol before the domain and it is HTTPS, because of ACM our connection is secure now.